

## CLAIMS

What is claimed is:

- 1           1.       A method for performing a search in a content addressable memory ("CAM")  
2 device, the method comprising:  
3           comparing a search key with compound entries in a CAM array, wherein at least one of  
4 the compound entries includes (i) a ternary CAM word having a data word and a mask word, and  
5 (ii) a mask specifier that indicates the state of the mask word, and wherein the search key  
6 includes (i) a search word component, and (ii) a search mask component, and wherein the ternary  
7 CAM word is compared with the search word component and the mask specifier is compared  
8 with the search word component; and  
9           generating a match signal associated with a compound entry that matches the search key.
- 1           2.       The method of claim 1, further comprising generating an address in the CAM  
2 array for the compound entry that matches the search key.
- 1           3.       The method of claim 1, further comprising deleting the compound entry that  
2 matches the search key.
- 1           4.       The method of claim 1, further comprising relocating the compound entry that  
2 matches the search key to another location in the CAM array.
- 1           5.       A method for locating an entry in an array of ternary content addressable memory  
2 ("CAM") cells, the method comprising:  
3           determining that a first group of bits of a search key match a first group of bits of the  
4 entry of the CAM array, the first group of bits of the entry having an associated group of local

5 mask bits; and

6 concurrently determining that a second group of bits of the search key match a second  
7 group of bits in the entry of the CAM array, wherein the second group of bits of the entry  
8 comprises a representation of the local mask bits.

1 6. The method of claim 5, wherein the second group of bits of the entry comprise the  
2 local mask bits.

1 7. The method of claim 5, wherein the second group of bits of the entry comprise an  
2 encoding of the local mask bits.

1 8. The method of claim 5, further comprising generating a match signal associated  
2 with the entry.

1 9. The method of claim 5, further comprising generating an address for the entry.

1 10. The method of claim 5, further comprising deleting the entry.

1 11. The method of claim 5, further comprising relocating the entry in the ternary  
2 CAM array.

1 12. A method for locating an entry in an array of ternary content addressable memory  
2 (“CAM”) cells, the method comprising:

3 performing a ternary compare operation between a first field of a search key and a ternary  
4 CAM word portion of the entry in the ternary CAM array, wherein the ternary CAM word  
5 portion of the entry includes a data word and a local mask word; and

6 performing an unmasked compare operation between a second field of the search key and  
7 a mask specifier of the entry in the ternary CAM array, wherein the mask specifier comprises a

8 representation of the local mask word.

1 13. The method of claim 12, wherein the mask specifier comprises the local mask  
2 word.

1 14. The method of claim 12, wherein the mask specifier comprises an encoding of the  
2 local mask word.

1 15. The method of claim 12, further comprising generating a match signal associated  
2 with the entry.

1 16. The method of claim 12, further comprising generating an address for the entry.

1 17. The method of claim 12, further comprising deleting the entry.

1 18. The method of claim 12, further comprising relocating the entry in the ternary  
2 CAM array.